

To: Van Dyke, Jill (DEQ)[VandykeJ1@michigan.gov]; Pennington, Michael (DEQ)[PENNINGTONM@michigan.gov]
Cc: Fish, Kim (DEQ)[FISHK@michigan.gov]; Wilson, Kristina (DEQ)[WilsonK17@michigan.gov]; Milne, James (DEQ)[MILNEJ@michigan.gov]
From: Burdick, Melanie
Sent: Thur 4/12/2018 5:09:36 PM
Subject: RE: Contacts for application/ program questions

Jill,
Thank you helping on your vacation.
This give me enough information for Monday's meeting.
-Melanie

From: Van Dyke, Jill (DEQ) [mailto:VandykeJ1@michigan.gov]
Sent: Thursday, April 12, 2018 10:22 AM
To: Burdick, Melanie <Burdick.Melanie@epa.gov>; Pennington, Michael (DEQ) <PENNINGTONM@michigan.gov>
Cc: Fish, Kim (DEQ) <FISHK@michigan.gov>; Wilson, Kristina (DEQ) <WilsonK17@michigan.gov>; Milne, James (DEQ) <MILNEJ@michigan.gov>
Subject: RE: Contacts for application/ program questions
Importance: High

Hi Melanie,

I am currently on vacation until Monday April 16. However, I was checking my email and noticed your inquiry.

I don't have all my files and notes with me but in general my comments are:

1. The existing Foth groundwater model was constructed to provide a conservative estimate for the influx of water to the mining pit, not to answer questions regarding wetland budgets or impacts.
2. The model as initially constructed was not achieving an acceptable water balance error so the river cells were added to define all of the wetlands in the entire model domain using the same arbitrary thickness, width, and K value to achieve a better result.
3. The parameters used to define the river cells for the wetlands in the site area do not reflect the actual sediments or conditions of the wetland.
4. Reportedly, many of the wetlands have streams in them and the river package was used to define these wetlands. There can be a problem with using river cells to define wetlands if the water level in the aquifer falls below the defined "river cell bottom" then flow into the aquifer remains constant. Since there are no adjustments for river flow and stage when using the river boundary cells, the supply of water to the aquifer from a "loosing stream" in the wetland area can be more than the flow in the stream. Since there are no flow measurements, there is no means of assessing this effect and it is seen as a problem.
5. The groundwater model uses a final recharge rate of 6 inches/year (recharge rates varying from 3 inches/year to 12 inches/year were tested in the simulation). Foth indicates that the river cells in the site area were defined to limit the flow back into the aquifer to the 6 inches/year recharge rate. It would appear that many of the wetlands defined with river cells in the site area then could be adding water at twice the recharge rate (the 6 inches/year recharge plus at least 6 inches/year inflow from the river cells).
6. Additional water being added to the aquifer in excess of what is actually available will artificially reduce the predicted drawdown effect and extent.
7. There are no flow measurements on the site streams which adds to the uncertainty of the model calibration as well as the impacts of the river cells.
8. There are no on-site measurements of the vertical conductivity/infiltration rates through each wetland base and no site-specific definition of the river cells based on soil boring data or conductivity of each site wetland.
9. The plot of the observed water level versus the computed water level target values shows a significant scatter around the 45 degree line indicating that the model is not well calibrated.
10. There are large residuals between the measured water levels and the model calculated water levels (at least 10 ft in some cases) in the site area that show a spatial pattern which suggests that there is likely a problem with the conceptual model design.
11. The plot of the residuals versus the measured values also shows a spatial bias in the scatter pattern.
12. The existing groundwater model was not calibrated and run to simulate conditions on a monthly basis that could provide flux information for use in the wetland budgets.

Hopefully this information will be helpful. There may be other issues that I failed to mention since I don't have my notes available but these are the issues that I discussed with Foth.

Jill

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From: Burdick, Melanie [<mailto:Burdick.Melanie@epa.gov>]
Sent: Wednesday, April 11, 2018 11:57 AM
To: Pennington, Michael (DEQ) <PENNINGTONM@michigan.gov>; Van Dyke, Jill (DEQ) <VandykeJ1@michigan.gov>
Cc: Fish, Kim (DEQ) <FISHK@michigan.gov>; Wilson, Kristina (DEQ) <WilsonK17@michigan.gov>
Subject: RE: Contacts for application/ program questions

Hi Mike and Jill,

Would you be able to give a status of your review of the new water budget material and the modflow analysis, respectively? EPA is meeting with Aquila to go through its response to EPA next Monday morning so I would like to talk to you before that so I have a current understanding of your review.

An e-mail or a phone call would be great. I'm at ASWM this week, so if there is a good time for you to call, let me know, and I can step out.

Thank you,

Melanie Burdick
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From: Wilson, Kristina (DEQ) [<mailto:WilsonK17@michigan.gov>]
Sent: Tuesday, April 03, 2018 4:12 PM
To: Pennington, Michael (DEQ) <PENNINGTONM@michigan.gov>; Van Dyke, Jill (DEQ) <VandykeJ1@michigan.gov>
Cc: Fish, Kim (DEQ) <FISHK@michigan.gov>; Burdick, Melanie <Burdick.Melanie@epa.gov>
Subject: Contacts for application/ program questions

Mike and Jill,

I spoke with Melanie Burdick this afternoon and she is anticipating a response from Aquila to the EPA objection letter within the next week. I am going to be out on vacation the afternoon of the 5th until the 16th. Melanie has asked who she can contact in my absence and I have provided you both as contacts if she has any questions about the groundwater model or wetland watershed budgets.

Thanks.

Kristi Wilson
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